

Year	Development	Grade	Overview
2011	Outside Algebra	Grade 3	This concept development unit develops an understanding of equalities and inequalities. Students explore finding the missing number (variable/unknown) using the concept of a balanced scale. They will represent and compare addition and subtraction expressions using ($<$, $>$, or $=$) and justify ideas and solutions with numbers, words, and symbols. The theme of outdoor activities will help motivate and engage students as well as providing examples of real-life algebraic situations that they can connect with.
2011	Patterns in Nature	Grade 2	This 3 day lesson is designed to introduce second grade students to the world of repeating and growing patterns. Students will create, recognize, and extend patterns, as well as make generalizations and apply function rules to understand the logic behind the mathematics. Since patterns are found in the natural world, students will use organic themes such as movement and insects to investigate the concept.
2011	Robot School Functions	Grade 2	Do you know that there is a Robot Repair School to fix flawed functions? Well, this unit will introduce and allow students the ability to investigate the concept of function tables and become certified graduates of RRS (Robot Repair School). Students learn the crucial parts of a function table (input, output, and rule) and how each intertwines to form a mathematical relationship. The students apply their knowledge of addition and subtraction in order to accurately solve a function table, which is a pre-algebra skill. Upon entering Robot Repair School and graduating at the end of this unit, students will have been exposed to various types of function tables.
2011	Variables: A Quest for the Unknown	Grade 4-5	This unit develops the concept of algebraic expressions. By discovering what is inside a locked treasure chest, students will gain understanding of the terms, variable and expression, write expressions from story situations, and evaluate expressions with and without parentheses. A prerequisite for this unit is an introductory lesson addressing the order of operations.
2010	Escape from the Zoo and the Clean Up Crew	Grade 2	These lessons introduce the concept of skip counting. It is expected that students are familiar with addition and subtraction facts to ten. During these lessons the students will help Ziggy the Zookeeper from The Zany Zoo help capture all the animals that have escaped from their cages. These lessons will increase students' knowledge of skip counting forward by twos, fives, and tens, as well as skip counting backwards by tens from any given two-digit number.

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2010	Patterning through the Rainforest	Grades 3-4	The beginning lesson reviews the terms repeated pattern, core, and element as students create, extend, and rename patterns revolved around a rainforest theme. The second lesson has students listening to a “growing story” about the rainforest entitled “The Hut that Pablo Built”. During this lesson, students will create growing patterns with various objects from the story. In the third lesson, students will explore the use of growing number tables with the use of pattern blocks. For this lesson students need to be able to skip count by 2, 5 and 10.
2010	Playworld Amusement Park	Grades 5-6	Through activities related to visiting an amusement park, students evaluate one- and two-operation expressions on a function table. By completing the function tables, students identify ordered pairs and graph them on a coordinate plane. Once graphed, students evaluate two expressions on the same graph to compare the result for different values of the variable.
2010	The Crazy Carnival	Grade 5	This lesson introduces expressions and equations and finding the value for an unknown variable. The concept develops the skills necessary to recognize the relationships between the input and output on a function table based on a rule. Students will create and complete function tables. It is expected that students have some background knowledge about numeric patterns and pre-algebra skills. During these lessons, a carnival theme will be used as students solve real problems and increase students’ knowledge of expressions, equations, and function tables.
2009	Planting Patterns and Fun with Functions!	Grades 4-5	In this Concept Development Unit students, through hands-on activities and problem solving, will explore and identify patterns in a variety of ways; compute functions that communicate the relationship between pairs of numbers; apply the pattern and function to extend the relationship; and finally display the relationship in a graphic format. By the end of the unit, students will be able to look at a function table, visualize the pattern, verbalize the rule for the table, and plot it accurately on a graph.
2009	Patterns, Patterns Everywhere	Grade 2	In this unit, students will familiarize themselves with patterns all around them. Through a variety of interactive means, students will identify, describe, extend, and create their own patterns as well as learn to analyze numeric and non-numeric patterns around them in daily life.
2009	A Parade of Patterns	Grades 2-3	This three-day lesson series is an in-depth unit that has students analyze numeric- and non-numeric repeating patterns and growing patterns. During this unit, students will find the core of repeating patterns and recognize the different elements given in repeating patterns. Students will then represent growing patterns using different representations such as pictures. Students will also need to determine the next level of a growing pattern and determine the number of elements in the next level. Let’s march to the beat of patterns and celebrate!!

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2009	Pardon My Expression	Grades 5-6	This unit introduces the concept of order of operations and its application in evaluating both numeric and algebraic expressions. Students will learn that an expression is a value obtained as a combination of numbers, symbols, and mathematical operations. During the three lessons, students will progress from applying the order of operations with two or more operations, to evaluating one-operation numeric expressions, and finally evaluating algebraic expressions with two or more operations.
2009	Pepe's Problematic Pizzeria	Grade 4	<p>This lesson introduces the concepts of patterns and functions by completing and writing rules for one-operation function tables.</p> <p>During this unit, each student will work to assist the restaurant manager, Pepe, in the preparation of dinner service. Students will be presented with a series of tasks that require them to use their knowledge and application of patterns and one-operation function tables.</p>
2009	The King's Rule	Grade 5	<p>This lesson teaches finding missing data on function tables, generating rules for function tables, and graphing data from function tables on coordinate grids. It is expected that students have prior experience with identifying numeric patterns on a function table, using variables to represent the rule for a function, and graphing ordered pairs on a coordinate grid.</p> <p>During this lesson, each student will create, analyze, and construct functions that are based around the story The King's Chessboard by David Birch.</p>
2008	Algebra Pond	Grades 2-3	In this unit, students will skip count, find the missing addend, and compare numbers using $<$, $>$, $=$. Students will also analyze numeric patterns in order to skip count by 2's, 5's, and 10's, starting with any whole number up to one hundred. Students will complete a number sentence in order to identify the unknown variable.
2008	Equations and Expressions	Grade 5	In this unit, students will use manipulatives, hands-on activities, problem solving, and real-world applications to interpret expressions and evaluate equations using variables. The variables or unknowns will be represented using letters and other symbols. Each lesson allows students to demonstrate their knowledge concretely, pictorially, and abstractly.
2008	From One- to Two-Operation Function Table	Grade 5	Students will use their knowledge of patterns and number operations to create, complete, and analyze functions tables. The students will progress from one operation function tables to two operation function tables. Throughout the lessons students will connect algebra to real life problems.

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2008	Fun Functions	Grade 4	This lesson unit addresses the process for solving missing numbers in function tables. It guides the students to realize the relationship between an input number and an output number. In addition, this unit gives the students the tools to successfully create a function table when given real life data.
2008	Functions and Folktales	Grades 4-5	Students are introduced to the rules and functions of algebra through a surprising media: folktales. Students will be exposed to the inconsistencies of human nature through Asian folktales, while understanding the consistency that exists in the mathematical world of algebra. Through a variety of interactive means, students will identify the patterns prevalent in functions tables of both increasing and decreasing values. Lastly, students will create their own function table following two-step operations.
2008	Repeated Patterns, Growing Patterns, and Functions	Grade 3, Second Language Learners	Throughout this lesson, students will be exposed to repeating patterns, both numeric and non-numeric, functions and function tables, and growing patterns. Students will use manipulatives, pictures, motions, games and verbal cues to give them a better understanding of patterns and how they can identify them in the real world.
2008	Roller Functions!	Grade 4	Throughout the course of these three lessons, students will learn how to complete function tables by determining the rule and translating a word problem into a function table. Lesson 1 develops students' understanding of how to complete a function table; lesson 2 builds upon that knowledge by requiring students to consider the properties of a function table; lesson 3 extends this knowledge to word problems. Every lesson is embedded within an amusement park theme.
2008	Stomping Away at Growing Patterns - Applying Real-life Applications to Non-Numeric Growing Patterns	Grades 2-3	Students will explore patterns using their bodies, manipulatives, and real world applications. They will identify, extend, and verbalize pattern rules found in geometric designs, sound patterns, and pictures.
2008	Zoomatician	Grade 3-4	In this growling unit, students will be exposed to algebraic concepts of patterns, functions, graphing, and problem solving. The students will become zookeepers in order to solve problems to maintain an attractive zoo.
2007	Building Patterns with Polygons	Grades 3-4	This unit explores patterns and functions within the context of geometry. Students will explore and recognize simple patterns as well as growing patterns with the use of geometric manipulatives and problem solving. They will understand patterns, relations, and functions. Students will also gain knowledge in spatial visualization. They will recognize and interpret data using patterns.

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2007	<u>Describing, Extending and Generating, Growing Patterns and Numeric Patterns</u>	Grade 3	This Concept Development Unit focuses on growing patterns, both pictorially and numerically. Throughout this unit students will focus on describing, extending and generalizing growing and numeric patterns.
2007	<u>Equations, Function Tables & Graphs: Tool for Building School Store Success</u>	Grade 5	Using function tables and algebraic expressions, students will plan and operate a school store to raise money for a field trip. Students will learn about variables, expressions, equations, function tables and rules, and line graphs as they move from concrete models to abstract thinking.
2007	<u>Function Tables with The Magic Function Machine</u>	Grades 3-4	Students will be able to complete a function table by applying a one operation rule, determine a rule based on the relationship between the input and output within a function table, and will create and use function tables in order to solve real world problems. Students will engage in real world problem solving using the Internet.
2007	<u>Missing Addends: Rewind and Find</u>	Grade 2	Students will learn to solve number stories involving a missing addend. By acting out a number story, then “rewinding” the action, they gain an understanding of the inverse relationship of addition and subtraction.
2007	<u>Out of This World Multiplication</u>	Grades 3-4	Through the activities of this unit, students will identify, describe, extend and create numeric patterns and functions using multiplication. This unit will develop algebraic understanding.
2007	<u>Pattern Play</u>	Grades 3-4	Patterns can be identified by using given elements, and then can be represented or extended. Pattern blocks are designed to help students create and describe patterns. Overhead projector sets of pattern-block shapes are useful for demonstrating designs for the whole class to see. Learning how and when to look for a pattern can help you solve problems. A growing pattern involves the progression from one step to the next. Each new step is related to the previous step as defined by the pattern.
2007	<u>Patterns, Functions and Equations: Cognitive, Concrete Connection</u>	Grade 5	This unit focuses on connecting patterns to functions and equations. The students will complete a series of patterns based on their own names in order to create function tables that express these patterns numerically. The students will extend their understanding of function tables using common real-world objects, analyzing their relationships graphically and numerically. Finally, students will generate full equations with variables.

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2007	Pet Store	Grades 3-4	It is essential for third and fourth graders to continue to practice basic addition and subtractions skills, and be able to recognize patterns to help them solve multi-step problems. This unit helps illustrate how students use these skills to function in the real world. In the following lessons, students will practice algebraic skills by finding missing variables using story clues, and practice applying math skills to real world situations as they make purchases and calculate change. The kinetic and visual activities that follow involve having students create, stock, and run their own pet stores over the four-day period that this unit takes place. They will practice flexibility and algebraic thinking as they continue to explore problems with unknown variables and multiple answers.
2007	The Great Unknowns	Grades 2-3	When students experience balanced equations they gain basic concepts of mathematical ideas as well as use problem solving skills needed in life. Students need to be able to apply an appropriate method of computation that demonstrates their understanding of mathematical theories. The activities included in this unit engage students in writing equations, recognizing patterns in function tables, and solving word problems. Differentiation for each activity is provided.
2006	Attributes and Patterns	Grade 2	The students will recognize and use a Venn Diagram to sort shapes based on similar attributes. Repeating patterns will be recognized, extended, completed and created. The core and the terms in the pattern will be identified. Students will predict future terms in a pattern.
2006	Functions -Day Trips	Grades 4-5	Students will use their knowledge of patterns and number operations by analyzing function tables and graphing them. These tables and grids will help determine which items are the best deals. The last lessons are intended to connect the classroom to real life situations.
2006	Growing Patterns: How do they grow? Part II Part III	Grades 1-2	Students will engage in hands on activities to build a concrete understanding of growing patterns. In order to do so, students will begin exploring non-numeric patterns in order to create a numeric pattern. This will provide the foundation for algebraic relationships/ functions. In the final lesson students will demonstrate their understanding of growing patterns by making a quilt.
2006	Missing Number Story Structure	Grades 1-2	The students will use prior knowledge of solving addition and subtraction word problems and story structure (stories have a beginning, middle and end) to support them in solving word problems with a missing number (start or change).

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2006	Perfect Patterns	Grades 2-3	This unit begins with non-numeric patterns. The students use linkage cubes, pattern blocks and hundred square paper on day 1 to create visual (non-numeric) patterns. Days 2 and 3 of the unit include increasing and decreasing numeric patterns. Students begin by identifying the pattern, extending it, then creating their own patterns in multiple ways using the same rule.
2006	Repeating Patterns, Repeating Patterns Part II Part III	Grade 3	In order to identify a non-numeric pattern, students should have the ability to identify the core and elements of the pattern. From this point they will be able to extend the pattern and repeat the core. Finally, students will apply their knowledge of patterns to real life situations.
2006	The Rhythm of Equations	Grades 4-5	In this unit, students will utilize manipulatives and problem solving strategies in order to solve algebraic equations. It begins with concrete concepts through the use of pattern blocks and concludes with more abstract, real-world connections, through writing and solving equations with the amount of syllables in phrases of songs.
2006	Order of Operation - Dr. X. Pression Part II Part III	Grade 4	The purpose of the lesson is for the student to master the concept of the Order of Operations so that an understanding of equivalent expressions is developed. The three-day Algebra lesson begins with the teacher providing review and reinforcement of the Order of Operations through a multi-modal approach to learning. At the conclusion of the three-day lesson, the students will be able to use Order of Operations to solve expressions and determine what constitutes an equivalent expression.
2005	Back To School With Patterns	Grades 2-3	Students will explore patterns using their bodies and items found in the classroom (school supplies). They will identify, extend, and create patterns using the vocabulary terms, term, core, and symbol.
2005	Butterfly Growing Patterns	Grades 1-2	In this unit, the students will analyze real-world problems involving growing patterns in order to identify their functional relationships. They will begin with identifying growing patterns and will extend these patterns. They will also complete charts and function tables.
2005	Don't Spill Over	Grades 2-3	In this unit, students will represent equivalent equations using variables. These lessons begin with the students using hands on activities to explore the topic of balanced equations using variables to represent shapes in equations.

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2005	Exploring Growing Patterns	Grades 4-5	In this unit, students will utilize problem solving strategies and reasoning skills in order to analyze patterns. It begins with a question about what students know about patterns, a discussion is launched regarding repeating and growing patterns their relationship with numeric patterns extending the data to function tables.
2005	Function Fever	Grade 5	Students will describe, extend, and make generalizations about numeric patterns. They will identify and describe situations with constant or varying rates of change and compare them. They will develop an understanding of graphing by creating models and developing abstract representations using real-life situations.
2005	Patchwork Patterns	Grades 2-3	Students will develop the understanding that patterns are sequences that repeat or change in an orderly way. They will recognize that patterns can be seen as well as heard. Throughout the unit, the learners will use key vocabulary terms related to repeating patterns. Students will learn to predict and extend the sequence of patterns. Lastly, they will create their own repeating patterns to meet given requirements.
2005	Pattern Bracelet Buddies	Grade 3	These lessons will deal with identifying, describing, extending and creating repeating patterns. Lessons will incorporate real life experiences. The students will create friendship bracelets to share with classmates.
2005	Patterns, Patterns, Everywhere	Grades 1-2	In this unit, students will identify, describe, extend and create nonnumeric patterns. It begins with the primary concept of identifying terms, core and patterns to include intermediate concepts, such as extending patterns, distinguishing between patterns and creating repeating patterns.
2005	Patterns Rule	Grades 5-6	Using hands-on activities in real-life problem solving situations, students will identify rules used in patterns, find a rule using pattern values, write a rule as a function, and interpret functions of patterns. Students will be able to identify the rule in a pattern, construct a function table, write an equation for a function, and explain the rule.
2005	Doing It Again, Repeating Patterns	Grades 4-5	Students will be able to understand patterns, relations, and functions by describing, extending and making generalizations about geometric patterns. Students will identify and build repeating patterns and recognize growing patterns that are the basis for algebra.

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2004	Concept Development Unit: Growing and Repeating Patterns through Manipulatives	Grades 2-3	This unit is designed to help students develop pattern recognition and comprehension skills across a broad range of applications. After exploring, identifying and creating a variety of patterns with Cuisenaire® rods, each student will create an individual mosaic displaying growing or repeating patterns.
2004	Exploring Repetitive and Growing Patterns	Grades 3-4	The students will be able to recognize a core in a repeating pattern and extend it for several terms. Students will also be able to create a symbolic version of a repeating pattern using letters. Lastly, students will extend a growing pattern and record terms that may follow using concrete and abstract examples.
2004	Function Junction	Grades 4-6	Students will use their knowledge of patterns and number operations to create a double line graph and determine which savings plan saves the most money the fastest.
2004	It's All Variable	Grade 3	This unit explores the concepts of algebra through three lessons. The first lesson develops understanding of balance and equality with the use of Cuisenaire Rods. In the second lesson students identify variables to use in mathematical sentences. In the final lesson the concepts of balance and variables are combined and students substitute values for variables to determine the values of equations.
2004	Missing Numbers Amusement Park	Grades 2-3	The students will solve missing number problems using a variety of real life situations encountered while visiting an amusement park, Dragon's Den. The students will have to do many activities including: Meet Me Over There, Guess the Weight game, and Tickets, Tickets, Tickets.
2004	Patterns: Recognition, Creation and Applications	Grades 4-6	Students will explore patterns using a variety of formats: music, people, weather, charts and pattern blocks. They will identify, describe, extend, and create patterns. Students will discuss their findings and write a summation of their pattern explorations including how to find a pattern, understand and identify the rules of functions, and define pattern vocabulary. Students will also relate the use of patterns to a real world situation. Students will examine thermometers and make accurate readings.
2004	Repeating and Growing Patterns: Calling All Patterns	Grades 2-3	In this unit, students will utilize problem-solving strategies and reasoning skills in order to analyze patterns. It begins with the primary concept of repeating patterns and continues to include intermediate concepts, such as growing patterns, which are the basis for algebra.
2004	Repeating Patterns: Progressing With Patterns	Grades 2-3	Students will explore patterns using a variety of manipulative and recording activities. They will copy, continue, extend, and create patterns, using formal language. (Term, core, symbol.)

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2003	Bar Graphs	Grades 2-3	In these hands-on lessons, students will review what they know concerning pictographs, collect data, and display that data through the creation of tables and bar graphs. Students will gain skills and build confidence in the creation of bar graphs by progressing sequentially through these three lessons. The lessons have been designed to move students from a concrete application to an abstract application. The ultimate goal is to assess the student's academic progress through the completion of these activities. The prerequisite skills required for maximum student achievement include prior experience with counting, sorting, transferring data to a table, and transferring data from a table to a graph.
2003	Copycat	Grades 2-3	Students will explore equal relationships using pattern blocks. They will gain experience using the appropriate terms for several geometric shapes and practice using the symbols $<$, $>$, and $=$. Upon completing this unit, students will be able to describe equal relationships by writing equations and find the missing addends in an equation.
2003	Fun with Binary Birthday Candles	Grades 4-6	These lessons show concrete, pictorial, and abstract applications of exponents. The students use snap cubes to create concrete representations of square numbers, and then they create pictorial representations of square numbers. In Lesson 2, the students are introduced to exponents and fill out function tables of $y = x^2$ and $y = x^3$. In Lesson 3, the students create function tables for $y = 2n$, and then are introduced to 8-digit binary numbers.
2003	Function Fun	Grades 4-5	The students will use their knowledge of multiplication, algebra and problem solving to create and solve various multiplication functions. The unit will begin with a review of basic multiplication. The lesson later explores the beginning elements of functions and algebraic thinking. The unit concludes with a summative assessment of student knowledge relating to functions and function tables.
2003	Games Galore	Grades 2-5	Students will be able to make predictions based on the probability of random events by conducting various experiments. The use of problem solving strategies will aid students in identifying possible outcomes that occur while spinning a spinner, rolling number cubes and selecting items from a grab bag. With the completion of the lessons, students will be able to describe the likelihood of such events by using the vocabulary terms associated with probability. Application of this newly acquired knowledge will allow students to assess the fairness of a created scenario. Students will be evaluated on their knowledge of probability through selected responses and a brief constructed response.

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2003	Grow Pattern Growwwwwwwww!	Grades 4-5	This Concept Development unit starts with the concrete objective of having students create and continue growing patterns and moves to the abstract objectives. The end goal of our lesson is to have students complete function tables based on a given rule.
2003	Growing Patterns	Grades 4-5	These lessons are designed to enable students to describe, extend, create, and evaluate a growing pattern in order to predict future outcomes to a given scenario. They will work cooperatively to develop rules for various function tables. They will then use these concepts to solve a real world problem.
2003	How Many Bumps on a Pineapple?	Grade 5	Students begin this concept development lesson by copying pictorial patterns using snap cubes and progress to continuing these patterns by adding the next term in the sequence. Students also create patterns of their own and members of their cooperative groups describe the pattern and determine the rule. The lesson moves into putting patterns and number sequences into function tables and explores determining the rule of a number sequence using a function table. This mathematics lesson is connected to science through Fibonacci sequence. The students learn that Fibonacci sequence is a number sequence that is also found in nature.
2003	Maybe It Will, Maybe It Won't	Grades 2-3	Students will use their problem solving strategies to strengthen and increase their knowledge of probability to solve various activities. The activities begin with the student's ideas of chance and what are the chances of certain events occurring. The ideas of chance leads into what is most likely to occur and what is least likely to occur with the use of spinners. Finally this leads to the understanding of a whole, and parts of a whole, which introduces the skill of fractions.
2003	Numeric Patterns of 2s, 5s, and 10s	Grade 2	This 3-day concept development unit teaches skip counting by 2's, 5's, and 10's. The unit introduces function tables by using Input Output boxes. Students will identify, describe, extend, and create numeric patterns.
2003	Patterning Our Way To Savings	Grade 3	In these lessons, students will be identifying and using patterns in order to solve problems. They will be using an authentic problem that will engage them in their task. They will use and identify patterns in calendars, t-charts, graphs, and hundreds charts.
2003	Patterns On The Move	Grade 1	Students will explore patterns using a number of different manipulatives and activities. They will copy, extend and create new repeating patterns. Introduction of the Venn diagram will assist students in discovering a variety of attributes in objects, such as shape, size, and color. Activities will encourage students to apply and connect to their real worlds. Students will learn appropriate math vocabulary to describe their work.

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2002	A Day at the Bay	Grades 3-4	This unit focuses on algebraic thinking, patterns, and functions. The students will take a mental field trip to the dock of the bay. As they tour and observe the dock's activities of the day, they will use their knowledge of patterns to solve the problems that occur there. They will also test their own solution to a major problem the boater's face.
2002	Algebra Across the Year	Grades 4-6	The focus of this unit will be incorporating increasingly difficult algebraic problem-solving activities into the existing curriculum. Three example activities are described which could be taught in each of the first three marking periods. Additionally, extensions for each marking period are provided, and suggestions for the fourth marking period activities are provided.
2002	Apples. . . Let's Take a Bite of Mathematics	Grades PreK-2	The hierarchy of learning patterns is that children learn to copy patterns, continue patterns, describe patterns, given a description of patterns build patterns, create patterns, make predictions and finally organize information to find regularity in the data collected. Repetition of activities helps children to begin thinking from a concrete to an abstract way of thinking. These activities use apples to reinforce the concepts of patterning. PreK students will copy and continue patterns as well as begin to create patterns. Older students build patterns according to a description and predict the nth term, organize data, and use the data to solve problems.
2002	Finelli and Company Catering	Grades 3-5	In this unit, students will be able to identify, create, and extend patterns. They will solve real life problems by using a function table.
2002	Pizza Patterns	Grades 1-2	Students will identify, create, and extend simple patterns. Students will be introduced to this unit with the book, "Pete's A Pizza" by William Steig.
2002	What's In A Quilt?	Grade 3	In this unit the students will develop skills for solving patterns. They will be able to determine the cores, relationships, and rules of patterns. They will copy, continue, describe, and create patterns throughout the unit.
2001	Do You See the Pattern?	Grades 3-5	In this unit, students will move through a sequence of activities that help the student develop needed pattern solving skills. They will be able to develop and reinforce strategies to find the pattern in a sequence. They will be able to copy, continue, describe, build, and create patterns.

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2001	Moving with Patterns	Grades 3-4	This unit explores patterns and various ways to communicate body movements using symbols. Students will demonstrate analytical reasoning by associating a symbol or geometric shape to a specific body movement. Students will create various kinesthetic patterns. The student performance assessment demonstrates the ability to create their movements in a pattern and visually communicate with symbols. They will be able to perform a dance identifying a pattern and communicate that pattern by movement associated with visual symbols. An extension activity will challenge their critical thinking skills by requiring the students to identify an extended pattern term.
2001	Not Afraid of Patterns	Grades 2-3	During three to four math sessions, students will identify, create, and extend patterns. The motivation for this unit comes from the book, <i>The Little Old Lady Who Wasn't Afraid of Anything</i> by Linda Williams. Students will be able create their own pattern and then extend the pattern of another student for at least three terms.
2001	Patterns All Around Us	Grades 3-4	The focus of this unit will be on patterns, functions, relations and problem solving. Students will apply their knowledge of basic geometrical shapes. They also will create their own pattern for African garments based on their investigation of African patterns in books and magazines.
2001	Pyramid of Patterns	Grades 3-4	This unit is designed to be three days of 45 minute lessons where the children will use patterns as a tool to discover secrets left behind from the Pattern Pharaoh. This unit is designed to help students identify pattern cores, sequences, and terms; use function tables; identify Pascal's Triangle; and use manipulatives with a teacher model in a cooperative group setting.
2001	Sign It! Shapes and Patterns in Our World	Grades K-3	This unit will focus on patterns, functions and algebraic thinking. Students will determine core patterns and shapes with special emphasis on geometric figures and transformations. Students will identify geometrical and directional shapes and signs in their community and immediate environment. Students will culminate these experiences by graphing data and developing a Sign Park.
2000	Candy Factory Espionage	Grades 4-5	This unit focuses on patterns, functions, and algebraic thinking. Students are industrial spies who use their knowledge of patterns to break into a candy company and steal the secret formula of a new candy. They also will create and test their own pattern to safeguard their companies secrets to prevent enemy infiltration.

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2000	Exploring Patterns	Grades 3-4	During five to seven math sessions, students will identify, create, and extend patterns. They will identify pattern rules. Students will be assessed on their problem solving abilities based on pattern skills taught during the unit. They also will enter a contest where they must create an original pattern and write a persuasive letter.
2000	Pattern Olympics	Grade 5	In this unit, students will be able to find the core pattern using several strategies and determine the rule. They also will analyze and recognize algebraic properties, and present and develop a graph using statistical information from the Olympics.
1999	Let's Quilt It!	Grades 4-5	This learning unit involves analyzing, observing, and collecting geometric patterns. The students will apply these skills independently, cooperatively, and in groups. Students will apply rules and functions in algebraic equations. Students will also explore the historical value of quilts in identifying historical images. From their work, they will create their own. Join us and cozy up with the quilt of many patterns!
1999	Pattern Explosion	Grades 3-4 Special Education	This unit includes various tasks that take students through a hierarchy of patterns, problem solving, and strategies to develop a rich math vocabulary. Students will be able to copy, recognize, describe and create patterns, as well as use a function table to identify the relationships in patterns and numbers. This unit will follow a sequence that will allow students to use knowledge and resources to complete new tasks. It will also allow teachers to use the tasks to assess students' needs and to develop students' knowledge.
1999	Patterns in Literature	Grade 3	This unit uses children's literature to teach students to copy, identify, extend, describe, and create patterns. The students will use a variety of tasks and work in both cooperative groups and independently to display their understanding of patterns and relationships.
1999	Powerful Patterns	Grades 3-4	These performance-based activities integrate language arts, technology and the study of patterns. The students will organize information, work cooperatively, use computers to develop a function table, and create a story slide show using the Kid Pix computer program.
1999	Quilts, "A FUNdraising Experience"	Grades 4-6	The class has decided to hold an auction to raise funds for the school. The students will be creating a class quilt for the auction. They will explore concepts of area, measurement and patterns found within parallelograms and triangles. The culminating activity will require students to create their own unique quilt designs.

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1999	Saving Those Wonderful Wetlands	Grades 4-5	Fourth and fifth grade students will use algebraic thinking to analyze, interpret and communicate data collected from an imaginary wetland that is being adversely affected by human actions. Students will apply problem solving strategies to real world situations as they explore environmental issues. This unit may be used as an instructional resource or a summative assessment.
1999	The Case of the Jinxed Jewels	Grades 3-5	This unit includes various tasks that help the students solve the imaginary “crime” of who stole Mrs. Ima Sorich’s necklace. Each student task provides a “clue” to help solve the mystery by eliminating suspects. In addition, each lesson focuses on one of four aspects of NCTM Standard 2: Patterns, Functions, and Algebra. These foci are patterns, symbols, functions, and models.
1999	The Maryland Crabbers	Grades 3-5	This unit will integrate mathematics with a social studies theme. Students will identify number patterns by using baseball scores. They will discover various types of patterns and functional relationships. This unit includes patterns/functions development and basic facts skills review.
1999	Tile Style	Grades 2-3	During five math periods, students will identify, create, and extend patterns. They will also identify pattern rules. As a culminating assessment, students will create a tile floor pattern that could be used in their school.
1999	Toy Factory	Grades 3-4	Students will improve their ability to recognize the relationship of patterns to multiplication. They will gain an understanding of multiplication and patterns and the relationship between the two. Students also will create their own toy design using pattern blocks to solve numerical problems in real-life situations. Science and social studies will be integrated into this unit so students will learn about mathematics in contexts outside of mathematics.
1998	Beary Good Pattern Skills	Grades K-2	This unit uses the story of Goldilocks and the Three Bears as a springboard to teach the students to copy, extend, describe, and create patterns. Students will use patterns in various ways to demonstrate their understanding of these concepts. The students will demonstrate mastery of pattern skills in cooperative learning groups and also will use patterns to solve contrived problems.
1998	Everything Comes Up Roses	Grades 3-7	The following series of activities introduce function tables, and apply the mathematical concept into a real-world situation. The students will have an opportunity to explore patterns within a function table, solve word problems, and make connections to the realworld. These activities allow students to enjoy mathematics creatively. Come see what Dr. Rosinbloom and staff have in store for your students.

Year	Development	Grade	Overview
1998	Growing Patterns	Grades 3-4	This unit involves building, describing, and expressing repeat addition patterns and rectangular arrays to represent multiplication tables. Students will use the constant calculator function to construct a visual representation of the multiplication tables. Students will apply their knowledge of multiplication arrays by constructing a giant classroom array.
1998	Let's Celebrate!	Grade 3	The third grade students will have an awards banquet. Your help is needed to arrange seating, organize student line-up order, and to design placemats for the banquet. This is a performance activity. We anticipate that the teacher already will have used similar performance assessment activities.
1998	Our School Looks Cool!	Grades 3-4	This learning unit requires students to make predictions, organize information, and determine and describe patterns. Students reflect to explain, compare, contrast, and describe pattern rules. The unit will help students plan gardens to beautify school grounds. If your school does not have a school wide clean-up day, this unit might be used as an Earth Day extension.
1998	Out of This World Functions!	Grades 4-5	Space is a topic that interests many students. These activities will introduce them to the concept of "functions." Through problem solving, students will apply their knowledge of patterns and mathematical operations to find the "rule" for the series of numbers represented.
1998	Pathways to Patterns	Grades 4-5	This learning unit can be used to introduce students to patterns and associated mathematical vocabulary. It will include the use of pattern blocks, tables, visual observations of the students' surroundings, and a brief introduction to the Fibonacci Sequence. By the completion of this unit, students will have the knowledge to create their own design using pattern blocks, to create a Fibonacci design, and to solve several numerical problems that emphasize patterns and relationships.
1998	Patterns Your Way	Grades 4-5	Our unit includes various tasks which take the students through the hierarchy of patterns. Included are several teacher resource charts on problem solving, ways to increase students' use of math language, and the hierarchy of patterns. Students will recognize and describe patterns as well as utilize function tables to identify relationships and patterns in numbers. This unit was designed so that the tasks are sequential, thus allowing the teacher to utilize tasks appropriate to their students' needs and knowledge of patterns.
1998	Patternsville	Grade 3	This is an interactive unit where students will design a community using pattern blocks. Their community will include streets and houses. Students will also consider the elements of a map and the wants and needs of a community along with the construction of their community. Students will use all four of their communication skills in the process of creating their community.

Year	Development	Grade	Overview
1997	A City Under Construction	Grade 3	Students will construct models for a city that is in need of new buildings. These activities will integrate patterns and their connection to real-life situations in the renovation of the city shopping center, sports complex, bridges, and single family homes.
1997	Create-a-Carnival	Grades 2-5	This unit will have students planning a school carnival to be held at the end of the school year. The development of the carnival will involve an art activity, setting up the dining area, establishing game rules, and assigning job responsibilities. The students will independently write an informative letter to the principal regarding one of the events that has been planned for the carnival. All activities will integrate patterns, writing, and "reallife" situations.
1997	Ecological Functions	Grades 4-5	The following is a series of activities in which students see patterns and make predictions, organize information, and find regularity in data relating to environmental issues. While the issues are authentic, some of the data has been modified so that it is manageable for students in the fourth and fifth grades.
1997	Happy Birthday!	Grades 2-3	Everyone feels that his or her birthday is an important event. Students will utilize their prior knowledge of birthday parties to explore, extend, and develop an understanding of how patterns work.
1997	Let's Be Fair!	Grade 3	The children will explore the concept of a fair game using experimentation and their knowledge of probability. They will analyze and play various board games. The students will design and construct an original board game as a culminating activity.
1997	Let's Make Connections with Patterns!	Grades 4-5	This is a series of seven activities designed to further the understanding of the significance of patterns in mathematics. The unit begins with an introduction to patterns and their integration in real-world situations. Activities include: (a) copying and continuing patterns, (b) creating patterns, (c) identifying pattern rules, (d) writing responses, (e) demonstrating knowledge of function tables, (f) testing problem-solving strategies, and (g) using number sentences. The unit culminates with a real-life application.
1997	Let's Open the Door to Patterns and Problem Solving	Grades 3-5	This unit is comprised of three lessons: Border Building, The Sorcerer's Apprentice, and Save the Rainforest. Each lesson is intended to be completed within one class period (50 to 60 minutes in length). The lessons are arranged developmentally and include suggestions for optional extension activities. Students will create patterns, make tables, and develop and justify their conclusions. The lessons make connections to science, social studies, music, and literature. Communication skills will be developed through math journal responses. Self-assessment forms will be completed in student pairs.

Year	Development	Grade	Overview
1997	Let the Games Begin!	Grades 3-5	This unit involves the students in a variety of statistical tasks. The students will collect, organize, interpret, and display data. The students also will create and evaluate games using the principles of probability. The final assessment of this learning unit includes a writing prompt.
1997	Meet a Mathematician	Grades 4-5	These activities will introduce students to Pascal's Triangle through the use of patterns in mathematics. Students will apply their knowledge of odd and even numbers, functions, triangular numbers, and other number relationships to analyze Pascal's Triangle.
1997	Patterns, Patterns Everywhere	Grade 3	This investigation will allow students to recognize, describe, and extend patterns. Tasks are designed to move students through a hierarchy of steps and from the concrete to the abstract level. Students will use the constant function on the calculator to show skip counting and solve problems. In cooperative learning groups, students will build, create, and explain patterns.
1997	The Hundred Day Quilt	Grades 2-3	Children will gain a working knowledge of patterns and the hundreds board using daily and weekly activities and incorporating the theme of the Hundred Day Celebration. Note to Teachers: The final product will be a quilt of 100 construction paper squares with ten squares in each row (like a hundreds board). Squares should be cut to 4 inches to allow for space to overlap when gluing squares together. Patterns of the quilt will vary, given the size of your class. Each day of the project, a group will be responsible for making and adding their square.
1996	A Day at the Amusement Park	Grades 3-4	This unit will have students going to an amusement park. At the park, they will make decisions concerning admission price, elapsed time, and ride selection. These activities integrate patterns and their connection to real-life situations. Students also will be asked to examine and extend various patterns.
1996	All That Glitters...	Grades 3-4	This lesson focuses on the use of patterns to solve problems geared towards creating, then producing a usable product - a piece of jewelry. Students will practice copying, describing, extending, and creating patterns. They will see patterns, make predictions, and organize data to find solutions. Students will write to inform and persuade.
1996	Election Mania	Grades 4-6	Students will serve as a campaign manager for a candidate in an upcoming election. They will determine the number of votes needed by a candidate to obtain a majority of electoral votes, create a presidential candidate glyph, determine states in which to campaign, write a persuasive letter, play a probability game, and read and interpret a fictitious population map.
1996	Shish Kebabs	Grades 3-4	This unit provides students with an application of patterning.

Year	Development	Grade	Overview
1996	Tall Tale Rollers	Grades 4-6	The study of tall tales is a motivating literature unit which appeals to a variety of people. In addition to providing enjoyment, it exposes its readers to a fascinating aspect of American culture. Following a study of the six tall tale characters*, intermediate students will explore probability as they attempt to "collect" tall tale figures.
1996	The Big Picture	Grade 5	This activity allows students to solve problems that integrate patterns and their relationships. Students will examine patterns in order to find regularity in data when solving patterns.
1996	The Chances Are...	Grades 3-5	This unit is designed as an introduction and exploration of the concept of probability. Students will manipulate a variety of everyday materials to discover the various possibilities of chance results. They will collect, organize, and interpret data both individually and as a class. This will illustrate the concept that with more and more data, experimental probability leads to mathematical probability.
1995	Crazy Critter Combos or A Crash Course on Creative Combinations	Grades 4-6	This learning unit introduces combinations through a variety of activities progressing from the concrete to the abstract. The students will gain a greater awareness of the many choices facing them in everyday life.
1995	Math Through The Ages--A Study of Patterns in Number Systems	Grades 5-6	This activity is the study of a variety of number systems. Students will research the background of number systems and the societies from which they came. They will share this information with classmates using the cooperative learning strategy jigsaw. Students will extend their knowledge and understanding of each number system through activities using each and identify patterns within each system. They will then apply this knowledge to the structure of our own system. They will identify the characteristic and patterns that make up a number system and use this knowledge to develop one of their own.
1995	Nature's Showcase (Patterns)	Grades 3-4	This is an interdisciplinary activity which integrates math and science. Students will be asked to examine and create patterns. Additionally, they will be asked to build patterns from oral and written descriptions.

Year	Development	Grade	Overview
1995	Neighborhood Math: How Does Your Community Store Add Up?	Grades 4-6	This activity integrates patterns and their relationships with an emphasis on economics in the community. Students will evaluate the economic relationship between neighborhood businesses and the community. Students will evaluate the economic relationship between neighborhood businesses and the community. Through the use of manipulatives, polls, comparative measures, and writing, students will access what best meets their needs as consumers. The students will determine the level of support contributed by neighborhood businesses.
1995	POGability	Grade 3	This unit is designed as an introductory unit to the concept of probability using a widely played game of chance using milk caps, commonly called "pogs." Students will identify the relationship between predictions and outcomes as it relates to probability.
1995	Problem Solving, Pattern Building	Grades 4-5	This activity helps students explore the relationships of patterns. Students will learn how to use a table to help investigate a pattern in an organized and systematic way. Students will examine patterns in order to make conjectures about relationships when solving problems.
1995	Stories, Stories, Books, Stories, Stories, Books, Stories, Stories, Books...	Grade 3	Through the use of literature, students will be presented with opportunities to learn what a pattern is, learn terminology, extend a pattern, and develop their own cooperative learning activity.